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ABSTRACT

Recently, increasing reliance on Web technology by end-users in organizations has encouraged corporate libraries to provide Web user training. To understand the effects of this new service, a case study was conducted on 17 participants at a large Canadian utility company. After an initial questionnaire, participant usage of the Web was unobtrusively monitored for two tracking periods through use of a custom-developed software application before and after the provision of an advanced Web training course. After both monitoring periods, one-on-one interviews were held with individual participants. Analysis of the results showed several key findings: improved Web use in terms of more substantial and efficient searches, increased comfort with Web technology, and greater appreciation for the services and resources offered by the corporate library. Results suggest the provision of Web user training may be a proactive way for corporate libraries to raise the profile of their departments within the firm. (Contains 15 references.) (Author/AEF)

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Leveraging the corporate library through Web user training

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Abstract

Recently, increasing reliance on Web technology by end-users in organizations has encouraged corporate libraries to provide Web user training. To understand the effects of this new service, a case study was conducted on 17 participants at a large Canadian utility company. After an initial questionnaire, participant usage of the Web was unobtrusively monitored for two tracking periods through use of a custom-developed software application before and after the provision of an advanced Web training course. After both monitoring periods, one-on-one interviews were held with individual participants. Analysis of the results showed several key findings: improved Web use in terms of more substantial and efficient searches, increased comfort with Web technology, and greater appreciation for the services and resources offered by the corporate library. Results suggest the provision of Web user training may be a proactive way for corporate libraries to raise the profile of their departments within the firm.

Introduction

Davenport and Prusak (1993, p. 405) report that corporate libraries "have performed relatively narrow functions, mainly associated with identifying and acquiring information, and have not become integrated into the major organizational processes for managing information". This perception has left corporate libraries in a vulnerable position. For example, Lancaster and Loescher (1994) indicate that many of the services offered by corporate libraries tend to be frequently under-used and under-valued, and Matarazzo (1981) states that library budgets are the among the first to be cut by senior management during harsh economic times.

In response, both researchers and library practitioners have proposed that corporate libraries re-evaluate their existing roles and responsibilities and devise new ways to add value to the organizations they serve. For example, Piggott (1995) calls for the reengineering of corporate libraries to deliver information using the most cost-effective electronic tools and products available in industry and the provision of a borderless service where information can be sought and used immediately by local or remote users. Davenport and Prusak (1993) agree. Recognizing the high potential of corporate libraries, the authors suggest corporate librarians break away from past roles as

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information custodians and content experts, and towards one that places priority on the establishment of connections between those who have information and those who want it. Training users how to access and use Web based information systems and services would fall into this new vision.

Lemon (1996) furthers this argument and describes the new trend in organizations to outsource services traditionally provided by corporate libraries which could eventually spell the demise of the corporate library itself. To remedy this situation, she urges corporate libraries to define a new set of core competencies, and identifies end-user coaching/training as one of three distinct areas in which the corporate library in her own organization decided to specialize. Likewise Church (1999) identifies the provision of Web search tool training as one of the evolving new roles of the corporate library in the next five years. He points out that on-line information products are no longer the unique domain of special librarians. Rather he describes how these products are moving to the realm of end-users as information providers supply Internet access to on-line databases and software companies develop more powerful and intuitive information search tools. Lancaster and Loescher (1994) agree and describe how this technology could usurp the role of the corporate librarian as an intermediary seeker of information as new Web search tools allow organizational participants to access on-line and CD-ROM databases themselves.

From these examples, there is evidence and support for the need for corporate libraries to deliver end-user training on how to seek and retrieve information on the Web as part of the set of core services regularly provided the organization. However, little research exists on the effect of offering such training to end-users, in particular to changes in their Web information seeking behaviour and their perceptions of the corporate library itself. It is unclear how the provision of such services could play out. Though information technology has provided corporate libraries with stronger weaponry in the past, no real evidence exists on whether the use of information technology has enhanced the image or status of the librarian in most institutions (Lancaster and Loescher 1994). However, there are indications that the provision of Web end-user training could leverage the role of the corporate library within the firm. For example, Lemon (1996) describes how the readjustment of corporate library services that helped encourage and support employees to share and use information from their desktops significantly increased the workload and profile of the corporate library in her own organization.

Case Study Site

To understand better the effect of Web end-user training by corporate libraries on the Web information seeking behaviour of participants and their attitudes toward the services and resources offered by the corporate library, a case study investigation was conducted at a large Canadian utility company. The organization, in operation for 150

years, serves over a million private, commercial and industrial customers and consists of more than four thousand employees operating out of six regional centres across North America. The company's corporate library began operation 30 years ago and has undergone several changes since inception. Originally it was called the "Information Resource Centre" and functioned primarily in the role of the traditional corporate library. However, a consultant study undertaken in 1996 led to several significant changes in its mandate and function. These changes were carried out over a two year period. During this time, both the staff size and centre's collection were reduced and emphasis shifted from paper to electronic products. The library was renamed as the "Business Knowledge Centre" (BKC) to reflect its new image as a supporter of business applications.

At the time of the study, the BKC offered research services utilizing on-line databases, CD-ROM products and the Internet, as well as maintained contact with appropriate outside sources of information. In addition to providing Web end-user training, the BKC was responsible for acquisitions, cataloguing, collection maintenance, and project management work. Staff consisted of one manager, two Senior Knowledge Research Analysts, one Knowledge Research Analyst and one Research Technician. The BKC serviced the information needs of the entire enterprise and reported to the Corporate Affairs department. Since the study, the BKC has been made a unit of the Information Services department responsible for decision support and is in the process of becoming a shared service business unit operating on a fee for service model.

In terms of the study sample, 17 participants were recruited by the BKC. These users represented a diverse sample population with varying computer backgrounds and familiarity with the World Wide Web. In total, the group consisted of nine managers, two consultants, five information system technologists, and one administrative assistant.

Methodology

The study was conducted from June to September 1998 at the organizational site. At the beginning of the study, an initial briefing was conducted where participants were told of the purpose of the study, their personal involvement, and the confidential nature of the research. Participants were also given the opportunity to ask any questions they might have. At the conclusion of this session, a questionnaire was distributed for participants to complete. From there, participant usage of the Web was unobtrusively monitored for two different tracking periods through use of a custom-developed software application called WebTracker before and after the provision of a two and a half hour advanced Internet training course. After both monitoring periods, one-on-one interviews were held with individual participants.

The questionnaire was adapted from one devised by Auster & Choo (1993). The first section dealt with the perception and use of 12 information sources by participants: the World Wide Web and 11 information sources selected from Auster & Choo's original list of sixteen sources. These were based on the sources used in past research on how people acquire information about the external business environment (Aguilar 1967; Culnan 1983; Daft et al. 1988; Keegan 1974; Preble et al. 1988). In total, the 12 sources consisted of Customers, Business Associates, Competitors, Radio/TV/Newspapers, External Reports/Studies, Managers/Supervisors, Colleagues in the Same Department, Colleagues in a Different Department, Internal Reports/Studies, Internal Memos, the Internal Library/Information Centre, and the World Wide Web. Participants were asked to rate their frequency of use for each of these sources and to give their perceptions of each source in terms of its quality and accessibility. The idea was to capture and measure participant perception of the World Wide Web and the corporate library compared to other information sources used in typical work activity. The second section of the questionnaire gathered background profile information. Participants were asked to rate their familiarity with computers and World Wide Web technology, and the number of hours worked and spent seeking information on the Web.

The custom-developed WebTracker software was installed on each participant's machine to monitor Web usage activity. WebTracker was designed because of the inaccuracy of using proxy or firewall servers to study micro moves when using the Web (Pitkow 1997) and the lack of current, publicly-available browser code for the Windows environment to design an instrumented browser. Previous studies used XMosaic on UNIX systems (Catledge and Pitkow 1995; Cuhna et al. 1995), but as this study focused on corporate users who predominantly worked on Microsoft Windows platforms, a different tool was required. It was felt that installing a new, instrumented browser would not allow observation of the actual behaviour of users participating in the study. With WebTracker, users could simply work on the Web as they did before, with their usual technical configurations and browser preferences including bookmarks and toolbar choices.

Primarily, WebTracker watched the Web browser and collected menu choices, button bar selections, and keystroke actions. These actions were associated with the opened Web page (URL), tagged with a date-time stamp and recorded in a daily log file. The software was deployed by the company's internal systems department onto each participant's individual work station to run at system startup as a minimized application. By developing WebTracker as a standalone, typical Windows application, participants could "see" it running, and have WebTracker available for suspending or viewing their usage logs.

For the first monitoring period, WebTracker ran on each participant's machine for ten business days. After this time, the researcher collected and analysed the daily tracking logs produced by WebTracker, formatting these into anonymous Web tracking reports.

Individual one-hour interviews were then conducted to discuss significant episodes of Web activity identified in the tracking logs. This served to understand better the context behind individual Web usage activity recorded in the tracking logs. During the interview, participants were asked to comment on the context surrounding significant episodes of activity. These were incidents identified by the researcher in the tracking logs that took a substantial amount of time, were recurring events, or were commented on by the participants themselves during the interview process.

The second Web monitoring period conducted after the Web training course lasted for the entire month of August to compensate for absences in Web usage during vacation time. As with the first round, individual Web tracking logs were collected and analysed by the researcher. Additional interviews were then conducted to obtain insights on the significant episodes of Web activity identified in the second round of tracking, as well as perceptions and feedback on the effectiveness of the advanced Internet training course. Several questions pertained to the participants' perception on the role of the BKC in providing future training initiatives.

Steps were taken to protect the privacy, confidentiality, and anonymity of the participants. At the initial briefing session, participants were told of the voluntary nature of their participation, their right to withdraw consent and their right to discontinue participation at any time without penalty. Prior to individual interviews, permission was asked to tape record conversations. In terms of computer-monitored data, participants had the option of turning the tracking software off. During the monitoring, participants were reminded that they were being tracked through the presence of an icon displayed at the bottom of their desktop screens. Further, as the tracking information was recorded to the participants' local hard drives, users were able to view the data logs themselves to see what information was being captured.

Results

In terms of the questionnaire, mean frequencies were calculated for each information source using an incremental scale consisting of six categories: 1) never; 2) < once a year; 3) few times a year; 4) >= once a month; 5) >= once a week; and 6) >= once a day. A high numerical score indicated a frequently used source. The World Wide Web was the third-most frequently used source (mean=5.0, sd=0.87), while the Internal Library/Information Centre ranked low as the tenth most frequently used source (mean=3.88, sd=0.93).

In terms of quality, the relevancy and reliability of each information source were rated by participants using an ascending Likert scale of 1 to 5 (1 being "very irrelevant" or "very unreliable" and 5 being "very relevant" or "very reliable"). The response scores from these two ratings were summed together to obtain a perceived source quality score for each source and averaged across all participants. Findings indicated that the

World Wide Web (mean=8.0, sd=1.22) was the fifth rated source in terms of perceived quality, slightly ahead of the Internal Library/Information Centre as sixth (mean=7.88, sd=1.41). The frequency of using each information source was correlated with the calculated perceived source quality index. No significant relationships were found between World Wide Web use and source quality, nor the Internal Library/Information Centre and source quality.

In terms of accessibility, the time and effort needed to approach, contact, or locate each information source as well as the ease with which to get the desired information from that source were rated by participants using an ascending Likert scale of 1 to 5 (1 being "very great deal" or "very hard" and 5 being "very little" or "very easy"). The response scores from these two ratings were summed together to obtain a perceived source accessibility score for each source and averaged across all participants. Findings indicated that the World Wide Web (mean=7.0, sd=2.0) was the eighth-most highly rated source in terms of perceived accessibility, while the Internal Library/Information Centre was the third-most highly rated source (mean=7.69, sd=1.45). The frequency of using each information source was correlated with the calculated perceived source accessibility index. No significant relationships were found between World Wide Web use and source accessibility, nor the Internal Library/Information Centre and source accessibility.

These results proved interesting. First, participants frequently used the World Wide Web despite its lower perceived quality and accessibility. There are two plausible explanations for this. One is that participants used the Web frequently, not because of its perceived quality or accessibility, but because it was presumed by users to be a source that actually contained the information desired. The other is that users had no choice but to use the World Wide Web to seek information. That is, they needed information which they assumed was not reasonably obtainable from any other available information source. Second, participants did not frequent the Internal Library/Information Centre despite its highly ranked accessibility. One reason for this may be the influence of the low perceived quality of the Internal Library/Information Centre by participants as an information source. Regardless, both findings support recent trends in the literature depicting the low profile of corporate libraries by organizational participants and the increasing reliance on Web use in the workplace.

In terms of user profiles, participants were found to be moderately technically proficient and comfortable with using Web-based technology in daily work practice. Collectively, participants reported that Web usage accounted for 18% of their daily work activity on average, and stated that they were at the "intermediate" level in terms of computer background and Web expertise.

Table I below summarizes the results of the participants' Web usage activity from the WebTracker logs collected over the pre- and post-training periods. Of the 17

participants, one declined to participate in the tracking portion of the study. Of these 16, all surfed the Web regularly during the pre-training period, while only seven searched the Web on a regular basis during the post-training period in August. This lower usage made it more difficult to make comparisons in Web usage before and after the training course. Overall, there were three reasons for the decreased usage in the post-tracking period: 1) August was the prime month for people to take vacations; 2) the fiscal year end for the company was September, translating into more work and less time for Web scanning activity by the managers and supervisors participating in the study; and 3) technical difficulties with the company's firewall in August inhibited use of the Web by some participants. As a result of these constraints, the pre-training period was more successful in terms of the amount of data collected.

	# of Days Web Used	# of URLs Visited	# of URLs Visited per Day	# of Unique URLs Visited	# of Unique Domains Visited	# of Sessions	# of Sessions per Day
Pre-Training Average (N=16)	7.38	314.31	42.59	153.44	36.94	14.00	1.90
Post-Training Average (N=7)	7.71	491.00	63.68	263.00	72.00	21.00	2.72
Post-Training % Increase	4.47%	56.22%	49.53%	71.40%	94.91%	50.00%	43.58%

Table I

Table I displays the overall averages for frequency and duration of Web use in both the pre- and post-tracking periods per participant. Though the post-tracking period was longer in duration, the average number of days WebTracker monitored participants in each period was roughly the same (pre-training=7.38 days; post-training=7.71 days). Overall, the results indicate sizeable increases in the number of Uniform Resource Locators (URLs) or Web page visited in the post-training period. Interestingly, more varied searching and browsing activity occured in the post phase of the study as reflected by the over 70% rise in the number unique URLs and doubling of unique URL hosting domains visited after the training course. Further, the number of sessions (i.e. periods of Web use without gaps in time over 30 minutes) increased as well in the post-training period indicating that participants searched longer and more intensively in the second round of tracking.

In terms of the content visited on the Web, analysis of the tracking logs showed participants primarily used the Web for work-related activities such as searching for

competitive information and tracking changes in legislation that might affect business practice. Overall, the logs showed more substantial and efficient information seeking episodes for participants who took the training. A notable example of post-training Web activity was increased usage of the BKC's web site off the company's intranet. In these instances, participants utilized the links off the BKC page to access external articles concerning the organization. Another typical instance in the post-training period was the utilization of many of the tips & techniques taught during the course. For example, the logs showed substantial usage by most participants of meta search engines which helped participants find information on the Web more quickly; in most cases, the pre-training logs showed no previous use of these sites.

Despite the general increase in Web use by participants after the training course, two of the seven participants in the post-training period experienced a decrease in usage. The reason some participants did not show an increase may be due to the short data collection time during both the pre- and post-training periods. A more longitudinal study would be required to yield more substantial evidence. However, analysis of the the interview data conducted later in the study suggests that participants who used the Web to a lesser extent searched the Web more effectively after the training course, while other participants increased their usage because they became more comfortable with using the Web itself.

In terms of the results from the interviews, several themes and recurring patterns of participant perception of the effectiveness of the training course were evident. In regards to course content, most participants felt it was good in that the course presented better ways to search for information on the Internet through the provision of short cuts and strategic search strategies. The two most popular items of interest identified by the participants were the introduction of meta search engines and the overview of the BKC's intranet site. Despite the general appreciation for the course, some participants felt the course content could have been more business unit applicable.

In terms of course effectiveness, some needed improvements were noted. Only two participants stated they had no ideas for improvement and that the course was "fine as is". Many commented on the need for more time, more hands-on training, and the utilization of better examples that pertained to daily work practice. One participant suggested that follow-up exercises be administered after the course for people to practice their Web seeking skills and if difficulties were experienced they could go back to the BKC to get additional help. Most described problems with the training equipment where individual workstations were either not working or suffered slow Net response times; it was recommended by several participants that these technical problems be eliminated before offering the course again. Despite these problems, an overwhelming positive response was given in terms of satisfaction with the course. Comments ranged from "good" to "very good" to "great". All participants were generally happy with the course and thought it was time well spent.

Overall, the course had a positive influence on participant Web behaviour. Generally it was found that participants applied their new learnings from the course which in turn led to more effective information searches, increased user confidence, and a more realistic understanding of the Web itself. For example, several participants stated that they used the tips and techniques learned from the training course when on the Internet, namely the ability to open two Netscape windows simultaneously, check for valid URLs in their bookmark files, use meta search engines, and focus their information searches with boolean terms. Interestingly, many remarked on the use of the BKC's list of hot sites and NEWSEDGE—two services they did not know existed prior to taking the training. These new learnings led to improved Web habits. For example, one participant commented that he now used the bookmark functionality offered in Netscape Navigator since the course taught him that bookmarks could save him from performing unnecessary searches in the future.

Many participants reported their ability to conduct more effective information searches. One participant reported that people who took the training searched the Internet in better ways—they now used the Web more logically in terms of their search approach which led to improved searches, the use of better search engines, and the utilization of the BKC's list of hot Web sites on the company's intranet. Another participant described her increased ability to plan a search strategy by being able to think ahead of the appropriate search parameters and search engines to use. Overall, most participants commented on their ability to find information "quicker" as a result of taking the course.

Another benefit of the course was increased participant confidence. Two participants stated the course made them feel so at ease with Web technology they decided to get Internet access at home. Several participants reported the course reconfirmed their understanding of what they knew about the Internet, thus easing anxieties about using the Web to find information. Many participants reported they were more comfortable with using Internet technology: one participant stated she viewed the Web as less threatening; another stated the course had enlightened him about the various functionalities of the Web. Overall, most participants reported the course helped them achieve a more realistic understanding of the Web itself in terms of its limitations as an information source.

A serendipitous benefit of the course was an improved appreciation of the BKC which was responsible for the coordination and delivery of the training. Most participants commented that they were interested in learning more about the services the BKC offered. Several participants mentioned that the course allowed them to learn about many useful services offered by the BKC that they did not know existed, primarily the BKC's role as an intermediary information searcher. For example, one participant commented that she was glad to learn that the BKC did intermediary searching and hoped that they would continue this role as she felt they had more expertise in that

area. Another remarked that he was now more aware of the BKC's desire to help people do searching, which he was not aware prior to the training. Another stated that he felt the BKC had more knowledge on how to conduct effective searches than himself and liked the idea of being able to use the BKC for this purpose. When asked about the future role of the corporate library, several remarked that the BKC should publicize its services more. Several participants stated that the BKC should also offer more courses. Interestingly, some participants felt the BKC should serve an expanded role beyond its current capacity, and stressed that the BKC should serve as an agent of change with respect to new technologies, programs, and techniques. One participant stated that the corporate library should operate in a more consultative role, while another felt the BKC should get more involved with strategic business planning as the BKC could provide a key handle on industry insights. Noteworthy is that these perceptions by participants did not exist prior to the Internet training.

Conclusion

In this study, a detailed investigation was carried out to determine the effect of a corporate library's Web training course on participant Web information seeking behaviour and their perceptions of the corporate library itself. Overall, several key findings were identified: improved Web use in terms of more substantial and efficient searches, increased comfort with Web technology, and greater appreciation for the services and resources offered by the corporate library.

These findings are important in that they highlight the need for corporate libraries to offer Web end-user training as part of the core set of services provided to the organization. For instance, the case study confirmed the low frequency of use of the corporate library and the general trend for organizational participants to utilize the Web to find their own information. Action must be taken by special libraries in corporations to respond to these trends if they are to survive in today's changing world. Otherwise the adoption and proliferation of Web based technology in organizations may usurp the role of the corporate librarian in general if others in the organization perceive that special libraries add little or no value to the corporation.

The provision of Web end-user training may be an ideal way for corporate libraries to leverage their current role. First, it gives corporate libraries the opportunity to market and demonstrate their information search expertise and profile their value-added services to others in the organization. This was evident in the case study when participants became aware of the intermediary search service offered by the corporate library and planned to use this service in the future. In this way, Web training could promote use of the more traditional services offered by the corporate library.

Second, Web training may improve the workload of corporate libraries in general. In addition to current duties, the provision of Web training would require corporate

librarians to stay abreast of new developments in Web technology. This may lead to more fulfilling work as librarians could hone their technical skills. Also, by teaching users to service their own information searches, corporate librarians would be utilized for more challenging search inquiries and consultation.

Third, Web end-user training may be a proactive way for corporate libraries to understand the business information needs of the organization. As users demand Web end-user training that contains relevant examples which reflect real business information requests, corporate librarians will have more incentive to stay in tune with the information needs and uses of employees.

All this may lead to a more specialized and sustainable role for corporate libraries in the future. By offering Web end-user training, the corporate library can better position itself as a department that understands both Web search tools and business information needs. Being perceived in this manner can lead to more involvement by corporate libraries in the use and deployment of Web technology across the organization, such as in the development and maintenance of the corporation's intranet. In this way, Web end-user training can help leverage corporate libraries by redefining and marketing their role as leaders and experts in the provision, organization, and access to Web-based information across the firm.

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